

NSW MURRAY REGULATED WATER SOURCES

Water allocations—Assessment process & allocation update

NSW Department of Industry – Lands & Water | R. Mannik, B. Graham | RGA presentations, 27 November 2018

This talk

Resource assessment process – overview

- Murray is a shared interstate resource
- Water allocation process – key principles

Allocation update

- Climate context
- Status of current water resources
- Water allocation statement

River Murray system – shared resource



River Murray system – legislative framework

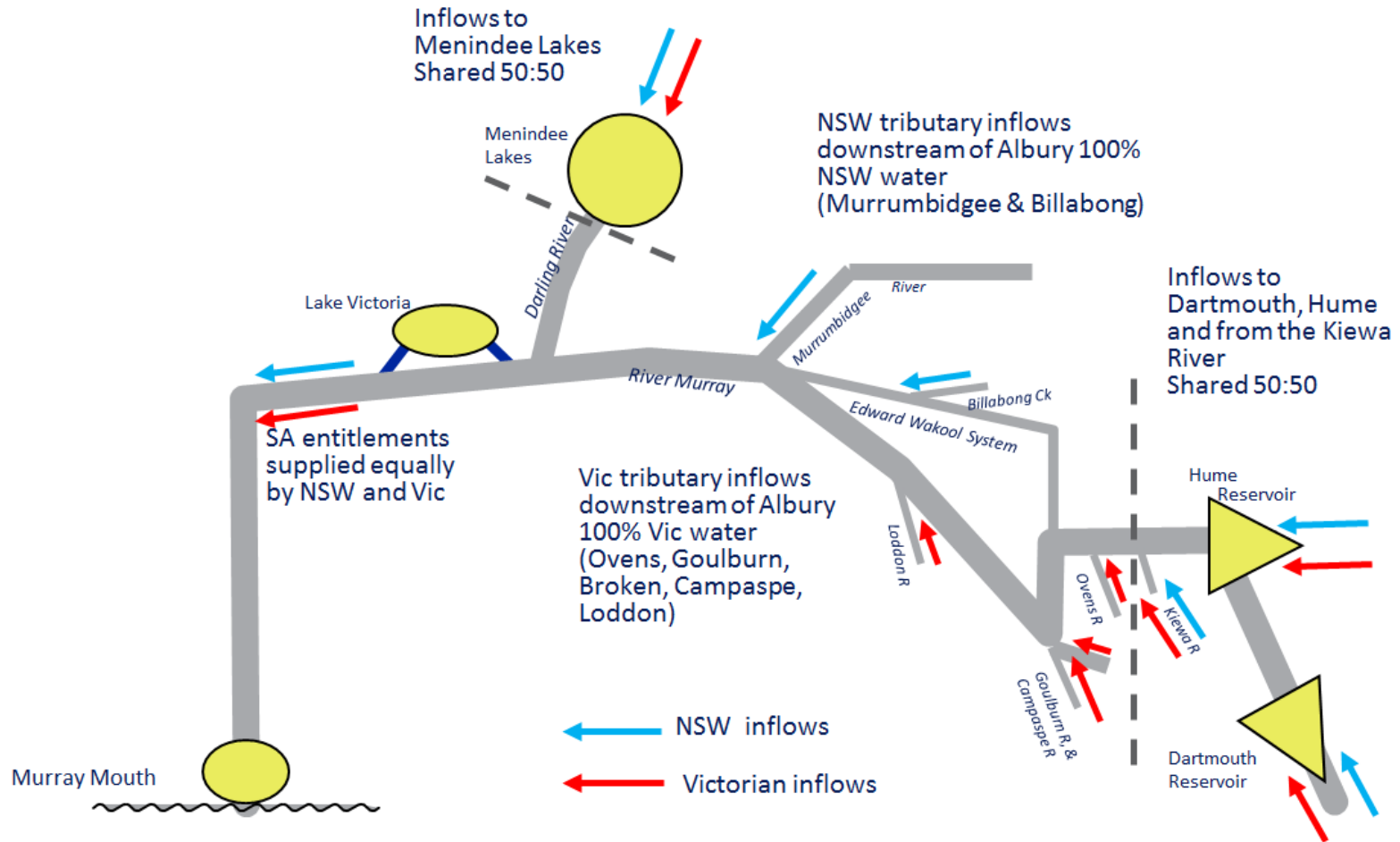
- Murray-Darling Basin Agreement
 - Basin Plan
- } Commonwealth level,
interstate agreements
Water Act 2007
- *Water Management Act 2000* = framework for water sharing in NSW
 - Individual water sharing plans
- NSW Murray and Lower Darling Regulated Rivers Water Sources 2016

River Murray system – shared resource

Water sharing rules under the Murray-Darling Basin Agreement

- NSW and Victoria share storage inflows (plus Kiewa River) (50:50)
- NSW and Victoria retain own tributary inflows

River Murray system – shared resource



River Murray system – shared resource

Water sharing rules under the Murray-Darling Basin Agreement

- NSW and Victoria share storage inflows (plus Kiewa River) (50:50)
- NSW and Victoria retain own tributary inflows
- NSW and Victoria share storage airspace (50:50)
- NSW and Victoria must equally meet South Australian share
- SA storage right – storing in upstream ‘airspace’ no impact on upper states

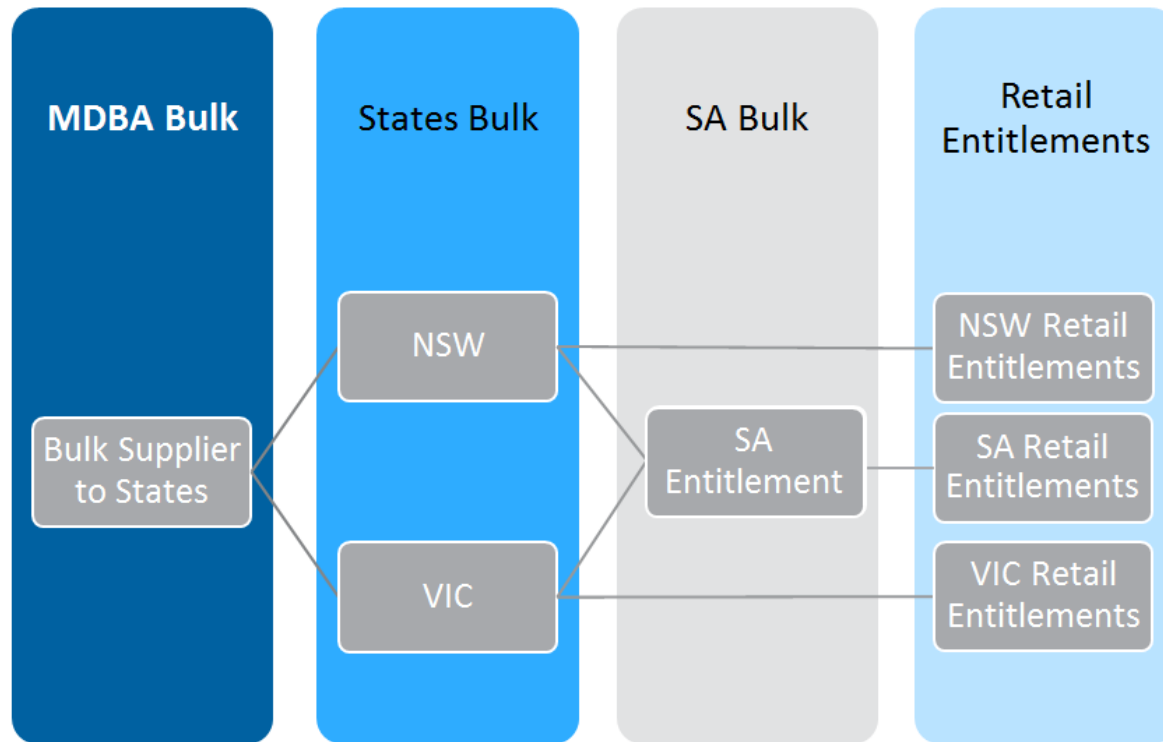
South Australia storage right

- SA has no natural features to allow an efficient storage
- Arrangement allows SA to defer a portion of its monthly entitlement volume and store in upstream 'airspace'
- No impact to upper states as this water is first to spill, and considered delivered if storage spilled
- If water was not stored, it would be delivered monthly in full to SA border as required by the Murray-Darling Basin Agreement
- Allows SA to manage in drought without solely relying on upper states to provide => benefit for NSW that SA can better manage itself in drought

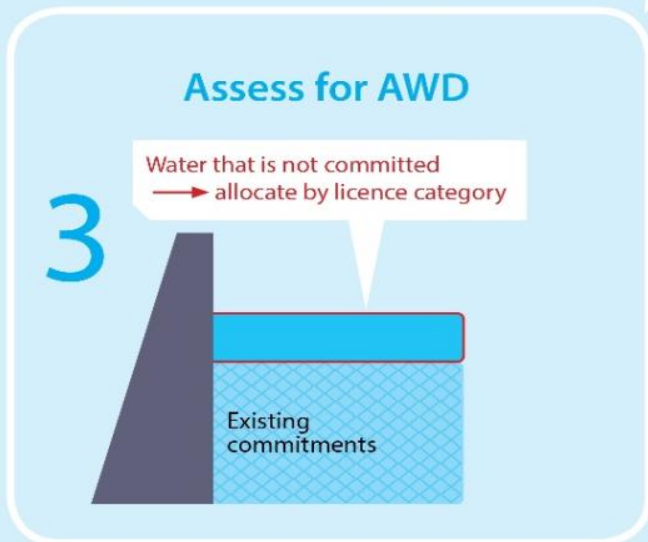
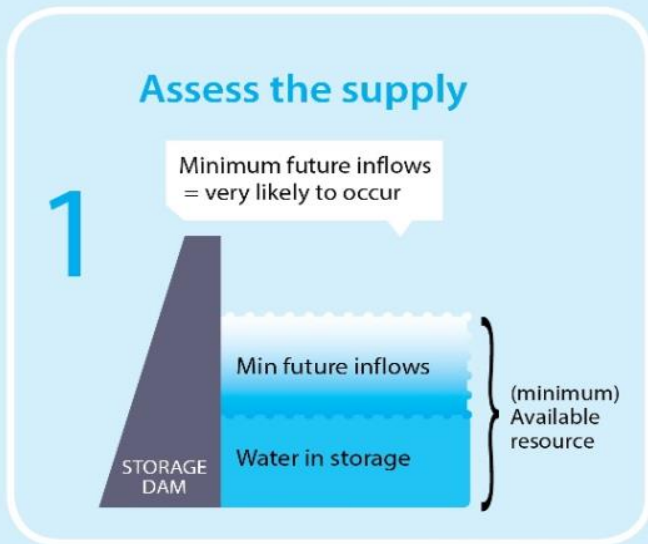
River Murray system – shared resource

River managed by MDBA (operations, bulk accounting)

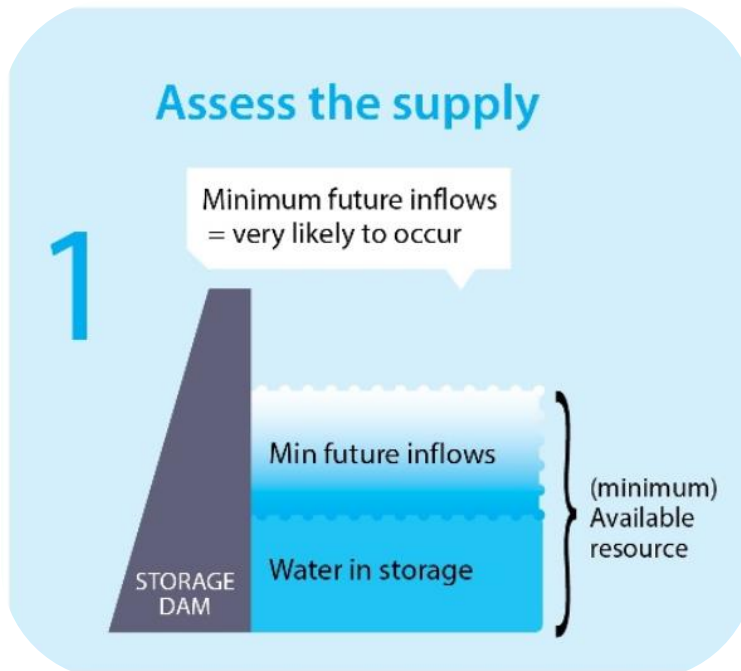
→ States advised of shares



Water allocation process – key principles



Water allocation process – key principles



- Water in storage
 - Hume, Dartmouth, Menindee, Lake Victoria

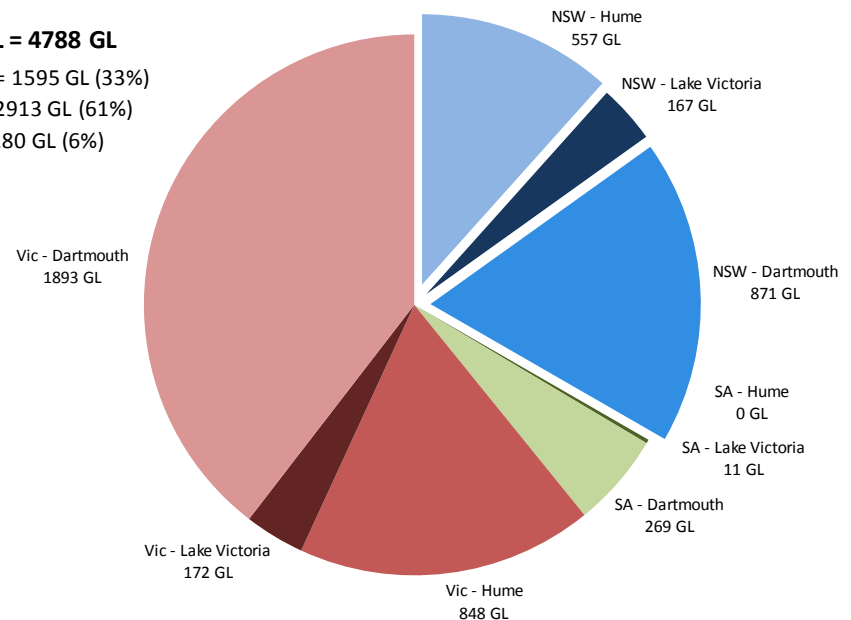
Water In Storages - end of October 2018

TOTAL = 4788 GL

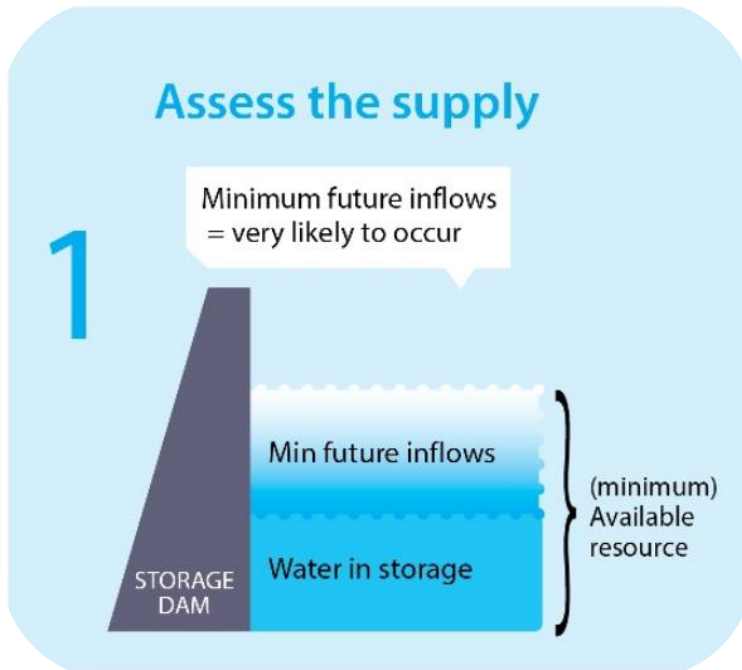
NSW = 1595 GL (33%)

Vic = 2913 GL (61%)

SA = 280 GL (6%)

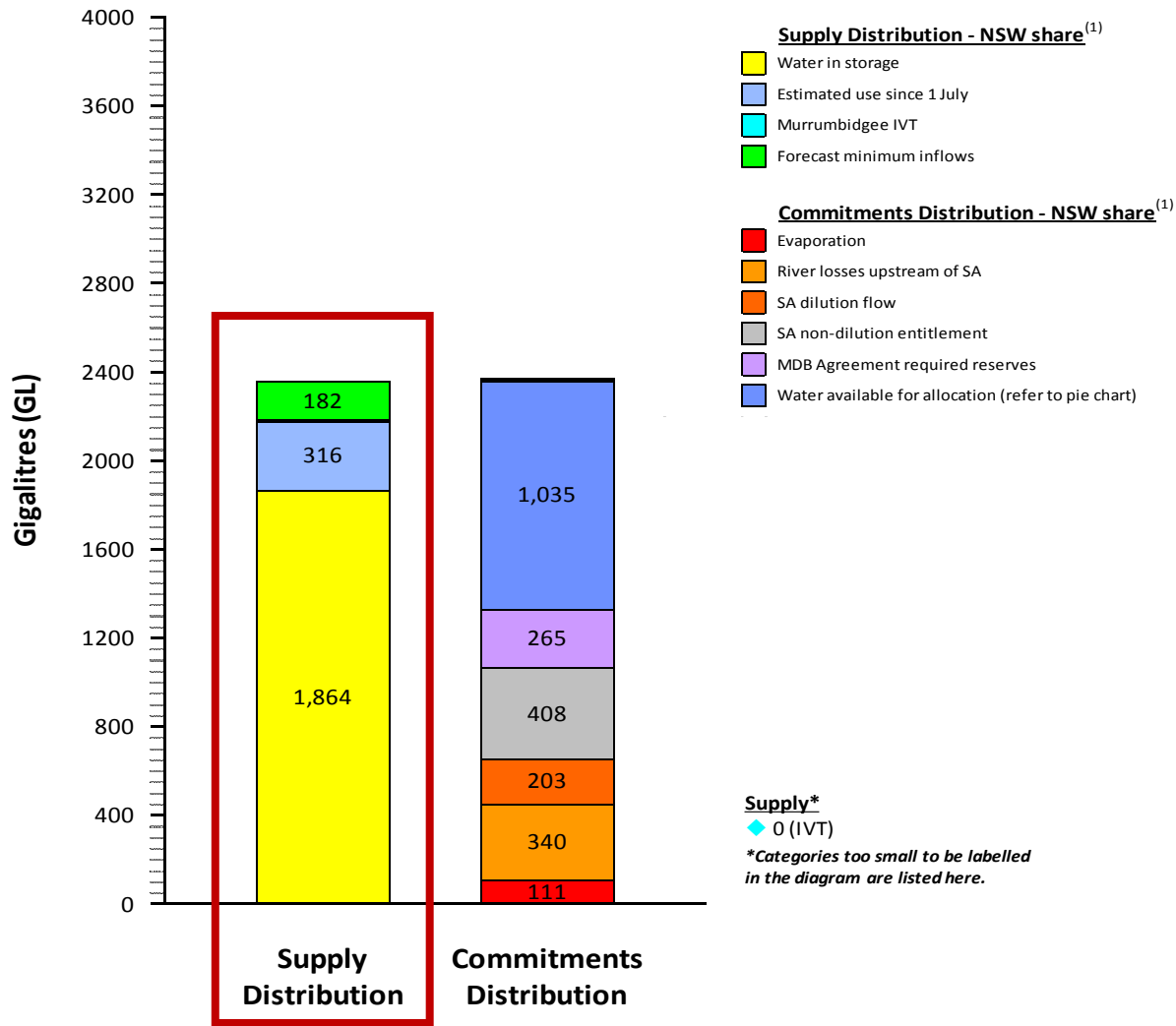


Water allocation process – key principles



- Water in storage
 - Hume, Dartmouth, Menindee, Lake Victoria
- Useful flows within weirs & en route
 - State tributary inflows
 - Excludes orders/diversions, supplementary access flows
- Minimum future inflows
 - Conservative 99% AEP inflows
 - Snowy scheme assured inflows
 - Murrumbidgee IVT
 - Any recent rainfall calculated recessions
- Adjustments
 - Trade, internal spills, meter reading updates

NSW Murray water balance – 15 November 2018



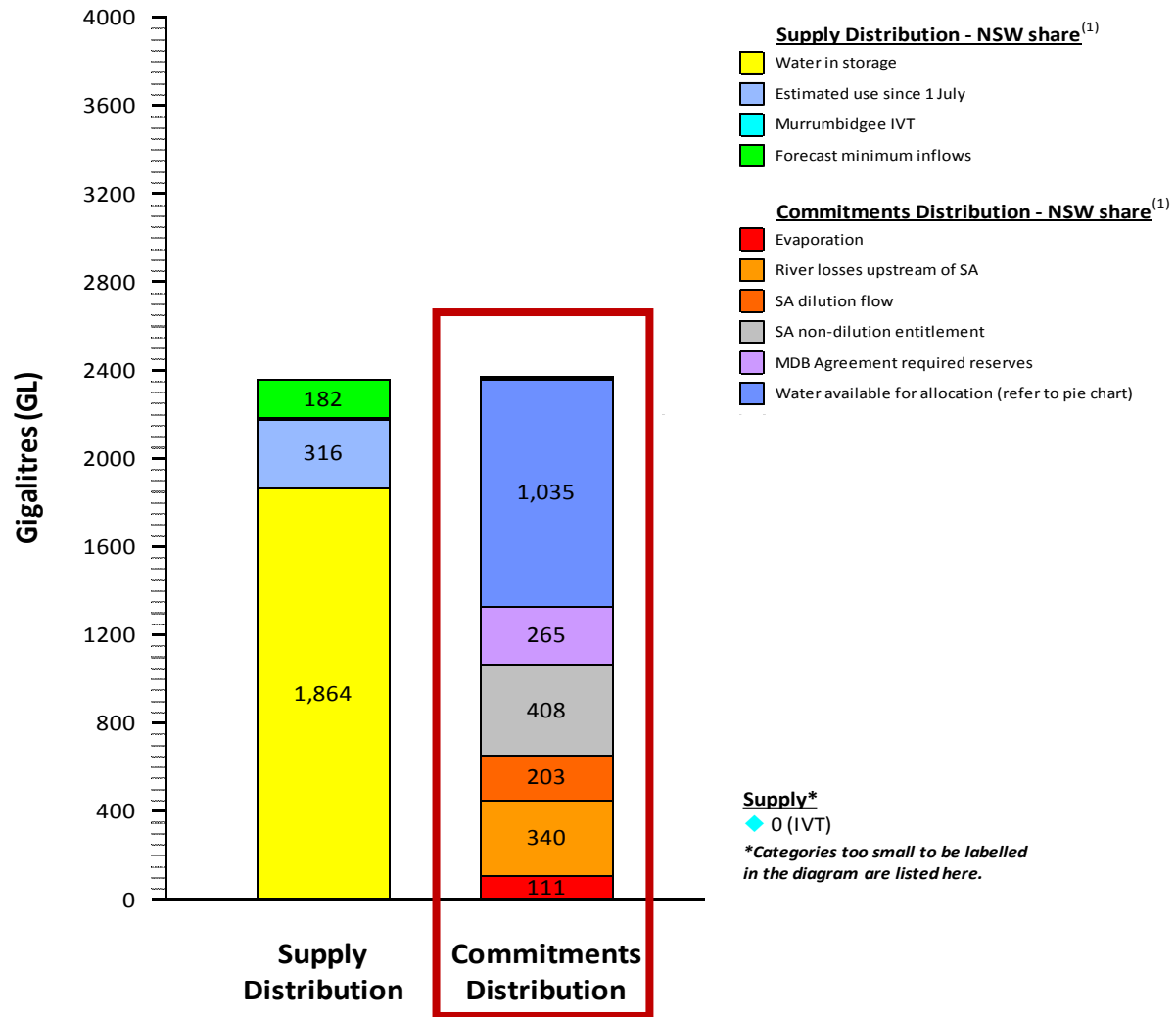
Water allocation process – key principles



- Subtract bulk-level commitments
 - Evaporation
 - Transmission losses to SA border
 - SA entitlement (dilution, non-dilution)
 - MDB Agreement required reserves

→ NSW share as reported in statements

NSW Murray Water balance – 15 November 2018



Water allocation process – key principles

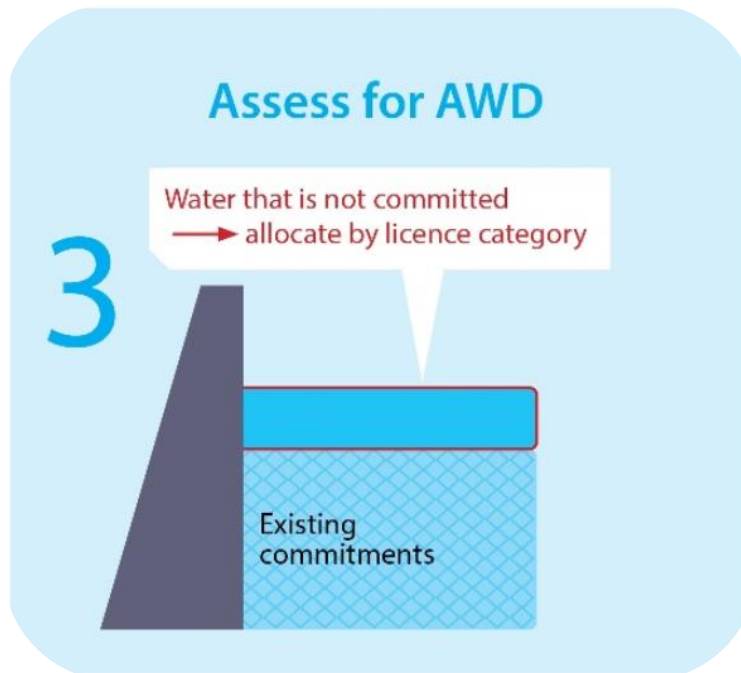


- Subtract bulk-level commitments
 - Evaporation
 - Transmission losses to SA border
 - SA entitlement (dilution, non-dilution)
 - MDB Agreement required reserves

→ NSW share as reported in statements

- Subtract retail-level commitments
NSW internal commitments (WSP)
 - Already allocated NSW volumes
 - Planned environmental water (BM-A, Wakool, RMIF)
 - Reserves

Water allocation process – key principles



NSW water sharing plan priorities

Licensed water is **shared** across the following categories:

- Domestic and stock
- Local water utility
- High security

} WSP expects these to be fully allocated on 1 July (97% for HS, 100% HS subcategories)

- Conveyance
- General security

} Then available water is incrementally allocated here

Entitlement distribution*

NSW Murray Regulated River

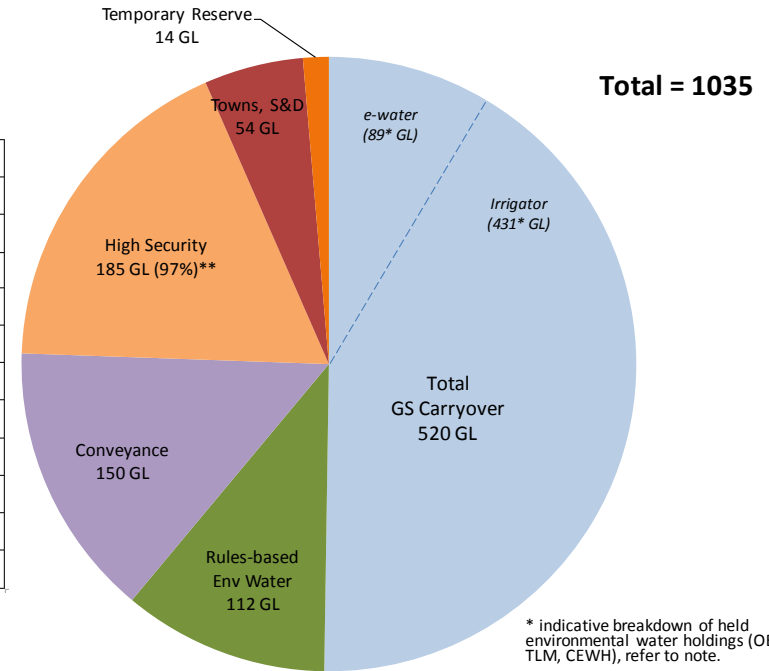
- town water supply **	37 GL	}	WSP expects these to be fully allocated on 1 July (97% HS 100% HS subcategories)
- domestic and stock	17 GL		
- high security	190 GL		
- conveyance	330 GL	}	Then available water is incrementally allocated here
- general security	1,674 GL		

* Volume at 100% allocation.

** Includes local water utility, HS(town water supply) licences.

NSW Murray resource distribution 2018–19 – as of 15 November 2018

Resource Distribution (15 November) for 2018-19	Volume (GL)
Total Available Resource ⁽¹⁾	1,035
less	
Carryover ^{(2), (7)}	520
Rules based Environmental Water ⁽³⁾	112
Towns, Stock, Domestic ⁽⁴⁾	54 (100%)
Announced High Security subcategory (education, research) ⁽⁴⁾	1 (100%)
Announced High Security ⁽⁴⁾	184 (97%)
Conveyance ⁽⁵⁾	150 (45%)
Reserves ⁽⁶⁾	0
Announced General Security ⁽⁷⁾	0 (0%)
Temporary Reserve ⁽⁸⁾	14



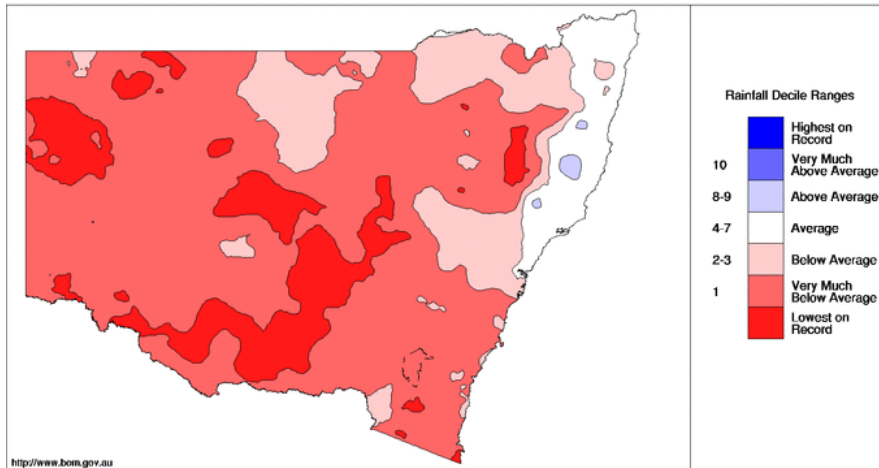
* indicative breakdown of held environmental water holdings (OEH, TLM, CEWH), refer to note.
** includes 1GL (100%) for HS subcategory (community & education,

Allocation update – context

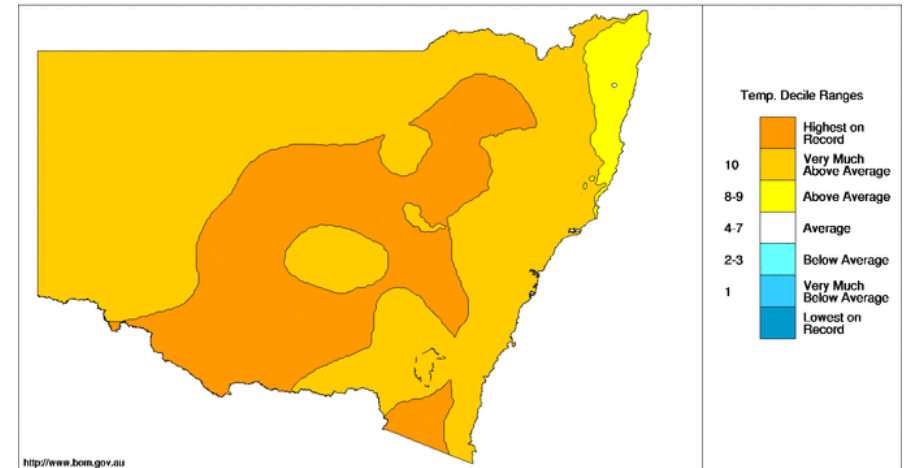
- This year has been hot and dry – third-lowest rain on record for January to October period since 1990 for the Murray Darling Basin

Allocation update – context

New South Wales Rainfall Deciles 1 February to 31 October 2018
Distribution Based on Gridded Data
Australian Bureau of Meteorology

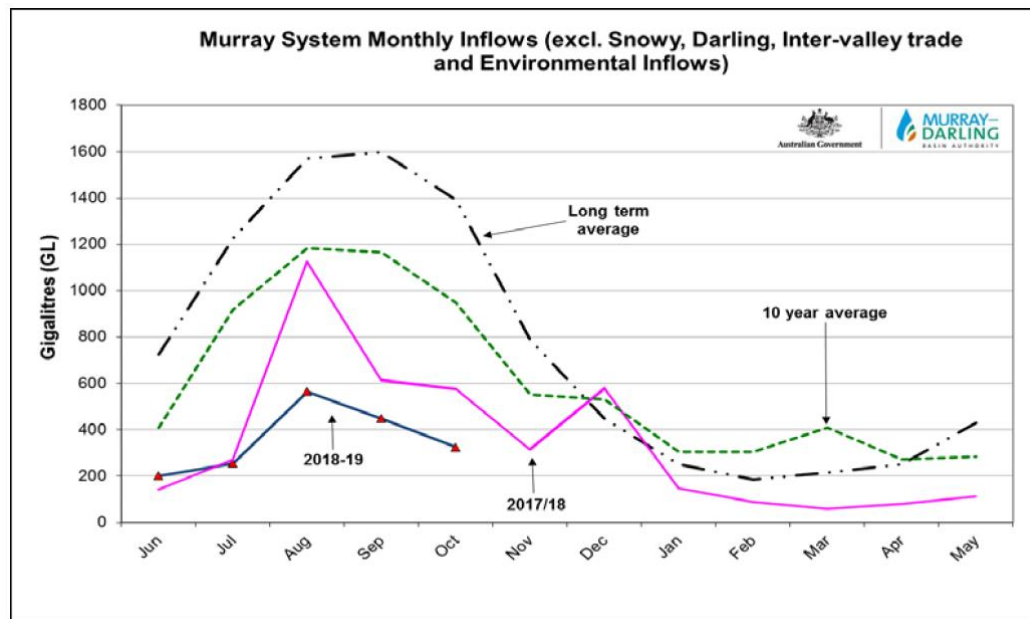


Maximum Temperature Deciles 1 November 2017 to 31 October 2018
Distribution Based on Gridded Data
Australian Bureau of Meteorology



Allocation update – context

- This year has been hot and dry – third-lowest rain on record for January to October period since 1990 for the Murray Darling Basin
- Inflows this water year are among the lowest 9% of historical record, i.e. 91 out of 100 years would have more flows than we've seen
- In general, Victorian tributaries contribute more water than NSW tributaries. This has been accentuated this year due to climate drivers, causing much of the rainfall to fall over the Victorian Alps



Allocation update – status

NSW Murray resources

- Menindee Lakes offline, no Murrumbidgee IVT contributions
- Over half (520 GL out of total 1035 GL) of NSW share of Murray is held by general security holders (in carryover)
- Total carryover volume is equivalent to 31% of entitlement, >80% is held by irrigators
- Water sharing plan requires conveyance to build to 165 GL before any general security allocation
- Currently conveyance is allocated 150 GL (15 GL shortfall)
- Environmental commitments shortfall of 60 GL (30 GL RMIF, 30 GL Wakool)
- Planned environmental water Barmah-Millewa Allowance (B-MA) of about 258 GL fully borrowed
- Any resource improvement in coming months will first accrue to conveyance licence category, then RMIF

Allocation update – regional comparison

Comparison to Murrumbidgee allocations

- Similar overall water availability
- Murrumbidgee: 22% carryover (419 GL) + 7% GS (132 GL) = 29% (551 GL)
- Murray: 31% carryover (520 GL)

Comparison to Victoria allocations

- Victoria generally receives more (x2) tributary inflows than NSW
 - 3,300 GL vs 1500 GL.
- Particularly this year (x4) due to climate drivers → more rainfall over Vic Alps
 - Since 1 June, almost 700 GL vs 176 GL → Vic has had about 500 GL more inflows
- Substantial Victorian reserves support allocations in ‘year 2’
- HRWS is a different product – reliability between NSW HS and GS
- HRWS have smaller total volumes so increase faster

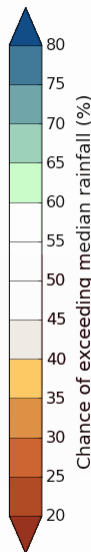
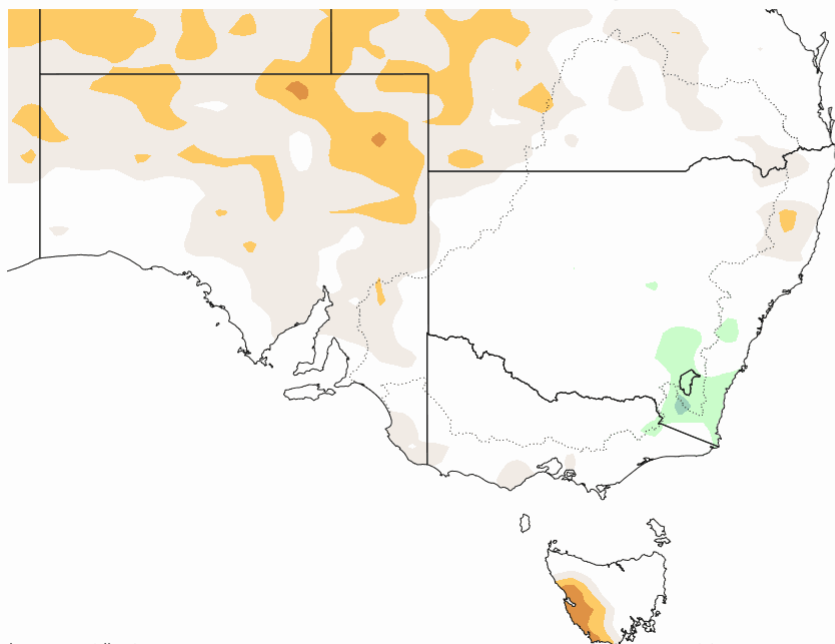
Allocation update – regional comparison

Comparison to SA allocations

- As per the MDB Agreement, upper states must build a reserve in the current year to be able to supply SA the following water year
- 2017–18 relatively healthy water availability = met that commitment
- → SA able to make 100% allocation this year

Allocation update – spring climate outlook

Chance of exceeding the median rainfall
December 2018 to February 2019



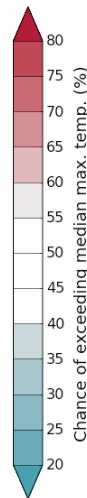
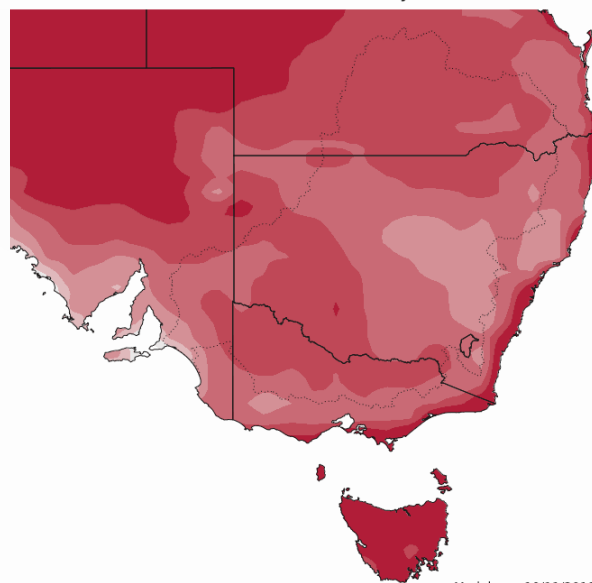
Model: ACCESS-S1
Base period: 1990–2012

Model run: 10/11/2018
Issued: 15/11/2018

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- The climate outlook indicates no clear drivers (December to February)

Chance of exceeding the median maximum temperature
December 2018 to February 2019



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Model run: 10/11/2018
Issued: 15/11/2018

Model: ACCESS-S1
Base period: 1990–2012

Allocation forecasts under various inflow scenarios (as at mid November 2018)

Forecast general security allocation (per cent) – using dry tercile[#]

(Any carryover water can be added to these indicative allocations)

Potential Inflow Conditions*	1 Dec 2018 General Security Allocation	1 Feb 2019 General Security Allocation
99 chances in 100 (extreme) (99%)	0	0
9 chances in 10 (very dry) (90%) [^]	0 ^{^^}	1
3 chances in 4 (dry) (75%)	1	4
1 chance in 2 (mean) (50%)	2	7
1 chance in 4 (wet) (25%)	3	12

Outlook modelling using inflow data for the driest one-third of years only and GS carryover of 31%.

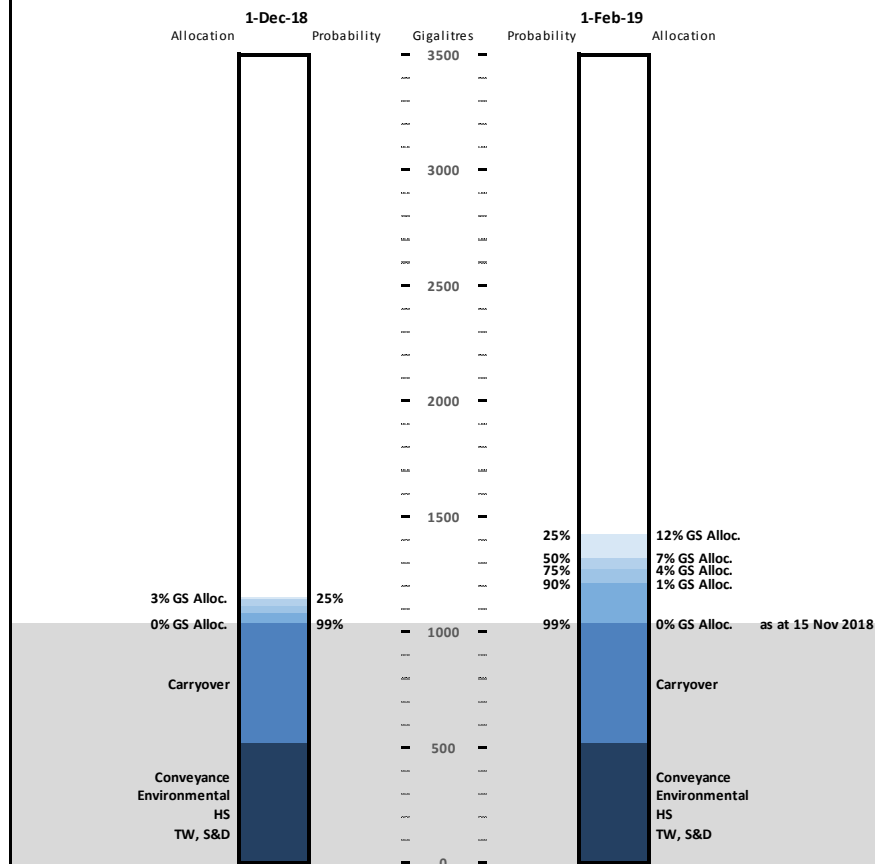
[^] July to October 2018 conditions for the system as a whole have been tracking at 91% AEP.

^{^^} Conveyance estimated to be around 165 GL at 1 December 2018.

B-M Allowance remains borrowed for all scenarios.

NSW Murray Valley Outlook

as at 15 November 2018



This figure provides indicative improvements in general security allocations for two forecast snapshots, 1 December 2018 and 1 February 2019. The allocation improvements are indicative only, and do not constitute guaranteed allocations. As of 15 November 2018, General Security allocation is at 0 per cent, and under 99% inflow conditions, will remain the same for the rest of the water year.



Water Allocation Statement

15 August 2018

NSW Murray and Lower Darling

Water allocation update and outlook

There has been **no increase in general security allocations in the NSW Murray regulated river system and remain at zero per cent of entitlement.**

July rainfall in the upper Murray catchment has been well below average and inflows into the Murray River system are in the lowest five per cent on record.

Access to all carryover is available, while future inflows will accrue as a priority to a shortfall in conveyance and environmental commitments, and then to general security entitlements. The current shortfall in Conveyance allocation is 105 GL and for environmental water it is 60 GL.

Allocations in the Lower Darling remain unchanged. The Menindee Lakes system is at 11 per cent of full supply capacity (holding about 190,000 megalitres) and is critically low.

	High Security	General Security	Average Carryover
Murray	97%	0%	31%
Lower Darling	100%	0%	15%

Murray storage levels (as at 13 August 2018)*

- Dartmouth Dam is 90 per cent full – rising slowly – currently at 3,462,000 megalitres (ML).
- Hume Dam is 47 per cent full – rising slowly – currently at 1,419,000 megalitres (ML).
- Lake Victoria is 52 per cent full – falling slowly – currently at 352,000 megalitres (ML).

* NSW share of this water is approximately 40%, 31% and 38% for these storages respectively.

State sharing of Murray resource

The monthly accounts to 1 August indicate 5,590 GL of total Murray resource in the very dry (99 percentile) case, of which 1,890 GL is needed to run the system and 3,700 GL is distributed under the Murray Darling Basin Agreement to NSW and Victoria.

The NSW share of this is about 1,330 GL and the upper States are required to supply equally South Australia's entitlement flow leaving NSW currently with 960 GL of available resource to distribute. This is an improvement of 20 GL for NSW on the last assessment.

Climatic outlook

The Bureau of Meteorology outlook for August to October, issued on 26 July, indicates conditions are likely to be dry and temperatures likely to be above average for the region.

The Bureau's climate models show that the El Nino-Southern Oscillation and Indian Ocean Dipole indicators are likely to remain neutral over the forecast period, but having a greater than usual chance of an El Nino event forming later in the year. These indicators generally point to below average rainfall for the winter-spring period in northern and eastern Australia.

Web: www.industry.nsw.gov.au/water

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- Allocation updates will continue to be published fortnightly
- Example here to illustrate



Water Allocation Statement

Trade

In the Murray, trade across the Barmah choke remains restricted to **'no net trade downstream'**. Downstream trade opens to the extent of the volume of any upstream trade.

The trade restriction helps to protect existing downstream entitlement holders from an increased risk of delivery shortfall due to the limited physical capacity of the Barmah choke.

Water users are encouraged to monitor the Murray-Darling Basin Authority (MDBA) website (www.mdba.gov.au) for information about the trade balance and status of trade.

The Menindee Lakes system is below 480 GL, the threshold at which the Lower Darling becomes administratively separated from the Murray. Temporary trade with the Murray is therefore closed. Trade typically remains closed until the system recovers to above 640GL. Trade within the Lower Darling water source remains unaffected.

Trade out and within the Murrumbidgee Valley is open, but trade into the Murrumbidgee Valley is closed. Trade into the Murrumbidgee Valley will re-open when the Murrumbidgee inter-valley trade (IVT) account balance climbs to 15 GL. Water users are encouraged to monitor the WaterNSW website (www.waternsw.com.au) for daily information about the IVT account balance and status of trade.

Next announcement

The next water allocation statement for the NSW Murray and Lower Darling valleys will be issued on **Monday 3 September 2018**. Following that, the next updated probability analysis showing the outlook for water availability under different inflow scenarios, including the rocket diagram will be issued on Monday 17 September 2018.

NSW Murray Resource Assessment Data Sheet

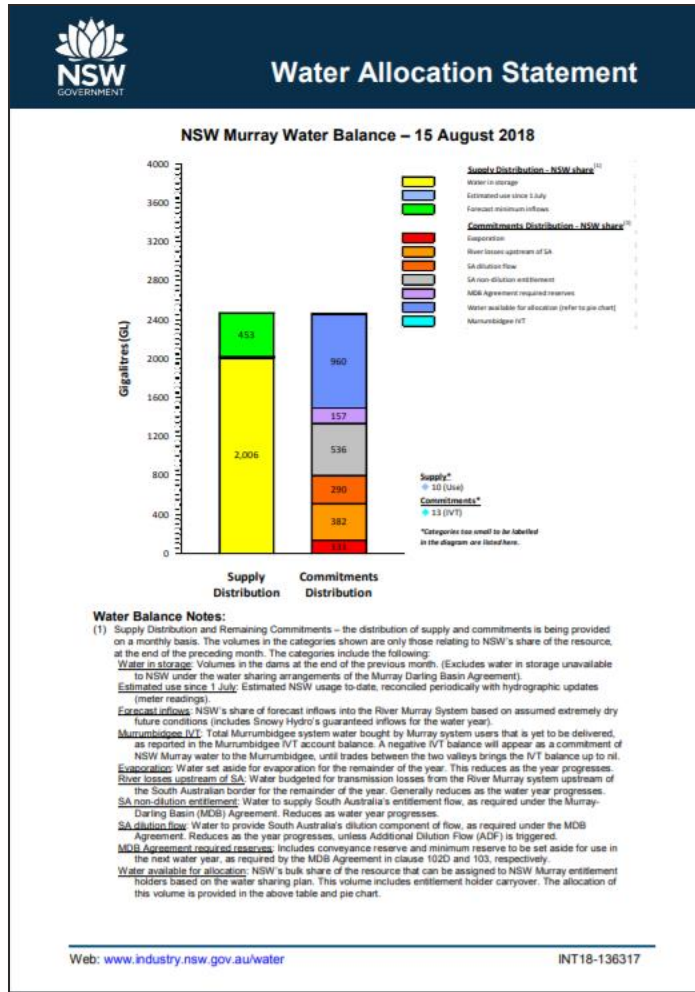
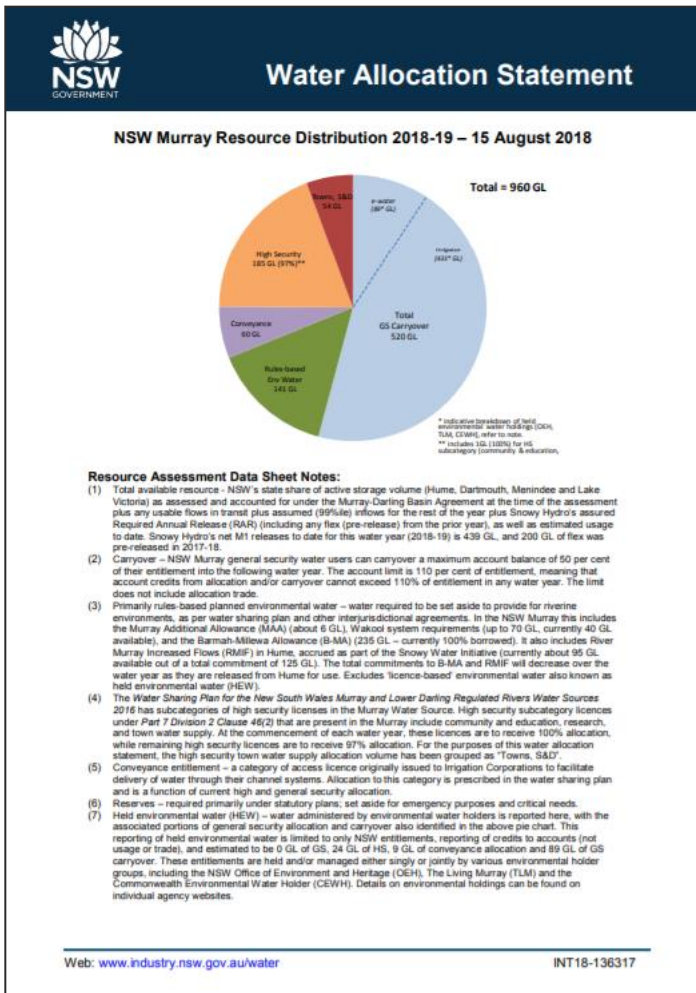
Resource Distribution (15 August) for 2018-19	Volume (GL)
Total Available Resource ⁽¹⁾	960
less	
Carryover ^{(2), (7)}	520
Rules based Environmental Water ⁽³⁾	141
Towns, Stock, Domestic ⁽⁵⁾	54 (100%)
Announced High Security subcategory (education, research) ⁽⁴⁾	1 (100%)
Announced High Security ⁽⁴⁾	184 (97%)
Conveyance ⁽⁶⁾	60
Reserves ⁽⁸⁾	0
Announced General Security ⁽⁷⁾	0 (0%)

Web: www.industry.nsw.gov.au/water

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- Many changes over recent years to include more and better information



- Feedback on the statements welcomed

Water Allocation Statement

NSW Murray Resource Assessment – Comparison with this time last year

Item	Mid Aug 2017 (GL)	Mid Aug 2018 (GL)	Comments
NSW share of total resources	1,410	960	Significantly lower following a very dry first half of 2018
less			
Carryover	690	520	Lower carryover
Environmental	76	141	Primarily due to RMIF
Towns, Stock, Domestic	54	54	Same
Conveyance			Lower due to lower resource
High Security	182	60	
General Security	185	185	Same
	218	0	Lower due to lower resource

Chances of improvement
The chances of improved inflows conditions and increased allocations are as follows:

Forecast General Security allocation (per cent) [#]
(Any carryover water can be added to these indicative allocations)

Potential Inflow Conditions	1 Oct 2018 General Security Allocation	1 Feb 2019 General Security Allocation
99 chances in 100 (extreme) (99%) [^]	0	0
9 chances in 10 (very dry) (90%) [^]	0 ^{^^}	14
3 chances in 4 (dry) (75%)	18	30 [*]
1 chance in 2 (mean) (50%)	29	55 ^{**}
1 chance in 4 (wet) (25%)	47 ^{**}	100 ^{**}

[#] Storage behaviour modelling using data for all years and general security carryover of 31%.
[^] June conditions were 95% AEP.
^{^^} Conveyance estimated to be at least 165 GL at 1 October 2018 in the very dry scenario (90%).
^{*} Borrow from B-M Allowance is partially repaid.
^{**} Borrow from B-M Allowance is fully repaid.

Web: www.industry.nsw.gov.au/water
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Water Allocation Statement

NSW Murray Valley Outlook

as at 15 August 2018

The chart displays two vertical bars representing water allocations. The left bar is for 1 Oct 18 and the right bar is for 1 Feb 19. A central scale shows probabilities from 0% to 99% and corresponding gigalitre (GL) values from 0 to 3500. The bars are stacked with different colors representing allocation types: Carryover (grey), Conveyance/Environmental/HS/TW/S&D (dark blue), and General Security (GS) (light blue). The 1 Feb 19 bar shows significantly higher GS allocations compared to 1 Oct 18, reaching 100% GS allocation at 99% probability, whereas 1 Oct 18 was at 0% GS allocation at 99% probability.

This figure provides indicative improvements in general security allocations for two forecast snapshots, the 1st of October 2018 and 1st of February 2019. The allocation improvements are indicative only, and do not constitute guaranteed allocations. As of 15 August 2018, General Security allocation is at 0 per cent, and under 99% inflow conditions, will remain the same for the rest of the water year.

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Thank you